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Eik Bezzel

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EXAMINER

OLSEN, KAJ K

ART UNIT

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/517,424	<b>Applicant(s)</b> BEZZEL ET AL.	
	<b>Examiner</b> KAJ K. OLSEN	<b>Art Unit</b> 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 06 July 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-6 and 9-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6, 9-14 and 16-22 is/are rejected.
- 7) ☒ Claim(s) 15 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Specification***

1. The outstanding objections to the specification have been withdrawn in view of the amendment to the specification.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:  
  
The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
3. Claim 22 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
4. In new claim 22, applicant doesn't define what any of depth, thickness, or mutual distance are even referring to in the claim. If applicant wishes to be further limited by these quantities, applicant will have to actually define these quantities in the claim.

### ***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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6. Claims 1-6, 9-13, and 17-22 are rejected under 35 U.S.C. 102(b) as being anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Lindmayer (USP 3,811,954).

Lindmayer was previously relied on, but was withdrawn when applicant amended claim 1 to state that non-transparent areas had openings filled by the transparent areas. Now that applicant has removed this limitation in the amendment of 7/6/2009, Lindmayer again reads on the claims as set forth below.

7. Lindmayer discloses a solar cell comprising an optical element having both a transparent area with substantially non-transparent area 5 along a surface of the optical element, wherein the transparent areas lie in the areas between the non-transparent area where the extent of the non-transparent areas is less than 1 mm in at least one direction (i.e. the width of the lines of 5 are only 1-20 microns (col. 3, ll. 45-55)). These non-transparent lines are arranged close to each other and extend at right angles. With respect to the transparent areas having a depth/width ratio that causes the optical element to allow light at particular angles, the examiner would first note that the difference in the index of refraction between the transparent silicon and the atmosphere the solar cell would be placed in would inherently result in light at very shallow angles not being transmitted through the transparent area. Hence the inherent depth/width ratio would result in this condition. In addition, because the fine lines of 5 define an area for the transparent areas and these fine lines would have a height, the combination of this unspecified height at the 0.03 cm spacing of the fine lines would means that light coming at particular angles would be unable to pass through the optical element at a given point.

8. With respect to either the transparent areas or non-transparent areas *appearing* as islands, devices should be defined in the claims based on what the device is and not how it *appears*.

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However, see fig. 3 where the transparent portions are completely surround that non-transparent fine lines and hence would be construed as appearing as islands. These islands are also elongated.

9. With respect to the extent of the transparent areas being at a maximum of ten times a right angle extent, Lindmayer does not disclose any dimensions for its elongated transparent areas for fig. 3. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize an extent that is a maximum of ten times an extent in a right angle dimension, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233. In particular, one possessing ordinary skill in the art would recognize that additional cross filaments could have been utilized to suitably deliver the photocurrent to the busbar.

10. With respect to the extent of the non-transparent areas and the non-transparent material being constructed of metallic material, see col. 3, ll. 45-50. With respect to the metallic material being a particulate, the use of particulate form of metallic material been an obvious form of metal to utilize for the electrode as metal materials in a particulate form are a convenient means for depositing a material down (e.g. slurry pastes or inks).

11. With respect to the solar cell being configured as an integral part of a window pane, this limitation doesn't appear to further define the actual structure of the device, but merely defines how the device is desired to be used. There is nothing that would prevent one from utilizing the device of fig. 1 as an integral part of the window pane.

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12. With respect to the non-transparent area functioning as a carrier, the claim doesn't specify what it is being carried. Because the metal non-transparent material can carry electrons, it meets the broadly defined carrier. With respect to the use of triangular cross-sections for the non-transparent areas or the use of tilted shapes, since such a modification would have involved a mere change in the shape or form of a component. A change in shape or form is generally recognized as being within the level of ordinary skill in the art. *In re Dailey*, 149 USPQ 47 (CCPA 1976).

13. With respect to the depth, thickness, and mutual distance as best understood (see 112 rejection above), Lindmayer gives both a thickness and mutual distance that exceeds 10 microns (col. 3, ll. 50-55), but Lindmayer did not explicitly disclose a depth. However, utilizing thicker metallic finger (thickness presumably be equivalent to applicant's undefined depth) would have less resistance while still transmitting the same amount of light. Hence, it would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize a line thickness (or depth) exceeding 10 microns so as to suitably conduct the photocurrent to the busbar.

### ***Claim Rejections - 35 USC § 103***

14. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

15. Claims 1-6, 9-12, and 17-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over either Swet (USP 3,780,722) or Rosenberg (USP 5,877,874) in view of Walker et al (USP 6,892,011). Swet and Rosenberg were cited in the previous office action, but are being relied on

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for the first time with this office action. Their use here was necessitated by applicant's amendment to change "optical element" to --solar cell-- in the claims.

16. Both Swet and Rosenberg teach the use of solar cells having an optical element that comprises a fiber optic bundle array. See Swet abstract and col. 2, ll. 35-49 and Rosenberg col. 13, ll. 22-37. Neither Swet nor Rosenberg disclosed that its fiber optic light guide comprise all the elements of the set forth optical element. However, as discussed in the previous office action, Walker discloses an alternate fiber optic light guide comprising both transparent and non-transparent areas wherein the transparent areas (72, 73) and non-transparent areas 71 are arranged in a manner analogous to the present invention. See col. 12, l. 56 - col. 13, l. 16 and compare fig. 7a-7c and 15 of Walker with fig. 1a-1c of the present invention. With respect to the optical element having a depth/width ratio that would allow light of a particular angle to pass through, this would be inherent for a structure such as Walker in view of its similarity in structure to that of the present invention. Moreover, see col. 20, ll. 31-53. Walker further shows that the non-transparent areas have openings that are filled with non-transparent areas (fig. 7a-7c) and that the non-transparent and transparent areas are located in the same plane. Because Walker discloses that its fiber optic array provide high quality light transfer and constitutes an easy way of manufacturing a fiber optic array (abstract), it would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the optical element of Walker for the fiber optic array optical element of either Swet or Rosenberg because Walker is a convenient means for forming high quality fiber optic arrays.

17. With respect to the openings being elongated, transparent fibers 73 and transparent cladding 72 of fig. 7b of Walker are in an elongated opening of non-transparent 71.

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Alternatively, Walker recognized that the fibers utilized could be any number of shapes (col. 16, ll. 23-34) and it would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize elongated fibers as a change in shape or form is generally recognized as being within the level of ordinary skill in the art. *In re Dailey*, 149 USPQ 47 (CCPA 1976). The use of elongated fibers would have resulted in an opening for the non-transparent material that is elongated as well.

18. With respect to either the transparent areas or non-transparent areas *appearing* as islands, devices should be defined in the claims based on what the device is and not how it *appears*. However, even giving these claim limitations further due consideration, in fig. 7c and 15, the transparent portions (72, 73) of Walker are islands in the non-transparent area 71 while the embodiment of fig. 7b of Walker would result in non-transparent element 71 would be appear as a line island surrounded by transparent portions 72 and 73.

19. With respect to the transparent areas have an extent that is maximum ten times the extent of the non-transparent area at a right angle to the face, the examiner is interpreting “maximum ten times” as being ten or less. Because the fibers of Walker extend only microns along the face (col. 16, ll. 50-52) while the thickness of the optical element Walker teaches the use of plates that are 26 mm thick (Table 3 in col. 23) which defines a direction at a right angle to the face, this is ten times or less. Alternatively, the embodiment of fig. 7B could be constructed into arrays that have a length of at least 25 cm in length with a 26 mm thickness (Table 3 in col. 23). This would result in an extent of transparent material (72, 73) that overlaps the 10 times the thickness of the device.



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20. With respect to the non-transparent material comprising semiconductor or metallic particulate material, Walker set forth no criticality for the choice of opaque material utilized for the device (col. 13, ll. 7-16). It would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize other opaque materials, such as the broadly defined semiconductor or metallic particles, for the opaque material of Walker because the substitution of one known material for another would have required only routine skill in the art.

21. With respect to the optical element being configured as a film, see the embodiments of fig. 19 and 21-23 where the optical element is in film form. With respect to this being attached to the surface of another optical element, that only defines the use of the device and the use of the device does not further define the structure of the device.

22. With respect to the use of a transparent substrate, the optical element of Walker is attached to a transparent diffuser 44 in the embodiment of fig. 19. See col. 20, ll. 9-15.

23. With respect to the non-transparent material functioning as a carrier for solar cell, the carbon black of Walker (col. 19, ll. 56-61) would be an electron carrier.

24. With respect to the shape of the lamellae, since such a modification would have involved a mere change in the shape or form of a component. A change in shape or form is generally recognized as being within the level of ordinary skill in the art. *In re Dailey*, 149 USPQ 47 (CCPA 1976).

25. With respect to the use of tilted lamellae, see fig. 19 and 21 of Walker.

26. With respect to the set forth depth, thickness, and mutual distance (as best understood), since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

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27. Claims 14 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lindmayer in view of Wariishi et al (USP 6,376,765). Wariishi is being cited and relied on for the first time with this office action. Its use here was necessitated by the reintroduction of Lindmayer.

28. Lindmayer set forth all the limitations of the claim, but did not explicitly recite that the solar cell was a photo-electrochemical solar cell. Wariishi teaches that an alternate form of solar cell is a photo-electrochemical cell where electrode leads 11 (similar to the electrodes of Lindmayer) are embedded in a transparent charge transparent layer (10 or 40). See fig. 3 and 4 and col. 57, ll. 18-53. Because a photo-electrochemical cell incorporates dyes which can increase the light gathering capacity for the solar cell, it would have been obvious to one of ordinary skill in the art at the time the invention was being made to modify the teaching of Lindmayer for a photo-electrochemical cell like Wariishi so as to increase the yield for the solar cell.

29. With respect to the non-transparent portions functioning as a counter electrode, Wariishi shows that the metal leads 11 can be utilized both with the counter electrode as well as with the other electrode. See fig. 3-5.

***Allowable Subject Matter***

30. Claim 15 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Response to Arguments***

31. Applicant's arguments with respect to claims 1-6, 9-14, and 16-22 and Walker have been considered but are moot in view of the new ground(s) of rejection. Moreover, applicant's amendment to claim 1 also makes the previous withdrawn Lindmayer a relevant teaching again.

***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KAJ K. OLSEN whose telephone number is (571)272-1344. The examiner can normally be reached on M-F 5:30-2:00.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Kaj K Olsen/  
Primary Examiner, Art Unit 1795

October 30, 2009